

ABSTRACT OF THE DISCLOSURE

The system and method are used for transparently transporting a multiplicity of data formats (TDM, frame, packet, cell, etc.) and bit rates in a deterministic manner over an optical telecommunications network facilitates purely photonic aggregation, separation and switching of granular, sub-wavelength capacity of bandwidths less than the line rate capacity. The sub-rate of the optical transport on a given optical frequency between network edge components uses time-slot based TDM channels that can be optically bursted across different wavelengths using wavelength hopping to allow all-optical switching of the channels between different signal paths in the optical switch nodes, on a time-slot-by-time slot basis using WDM to reduce the probability of blocked connections. The connection management of these wavelength hopping optical TDM burst, (referred to as waveslots herein) is done using a connection protocol that employs conventional "least cost" path calculation algorithms to identify target connection routing through the optical network. A path integrity process ensures capacity, link removal and recalculation in cases of blocked connections. The time slot and wavelength map can be represented as a two dimensional matrix. Availability calculations can be done using simple matrix logic operations. The capability of the network to reconfigure and rearrange itself is maximized by the use of wavelength hopping. A full optical connection oriented bandwidth mechanism for management of that granular capacity is provided.